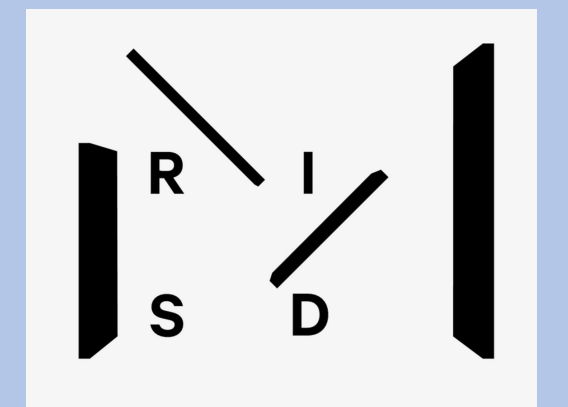




Is Silver A Color? A Survey of Lusterware Objects and Their Formidable Elements

Bri Turner, RISD Museum | Dr. Catherine Cooper, NCPTT | Ingrid Neuman, RISD Museum



Introduction

Luster has been utilized as a decorative element for ceramics since ~ the 9th century in Mesopotamia.¹ The use of metallic oxides as a glaze in addition to a low oxygen firing method yields shimmering iridescence that is widely prized.² This particular survey explores 18th-19th century English lusterware that was produced to mimic real silver tea services, which were much too expensive for the working class to afford.³ No one really knows who "invented" this type of overall silver luster, but most recipes state that silver oxide was not used because of how fast it tarnished, and so platinum was used to create the bold reflective glazes.⁴ Platinum is endemic to the Andes Mountains in South America and the Ural Mountains in Russia.⁵

Background

For more information we looked to the recipes of artists who experimented with lusterware during this revival and evolution of lusterware. Thomas Lakin worked in the potteries and was an early adopter of lusterware.⁶ Upon his death in 1824, his widow Catherine published his notes in a book titled, *Potting, Enamelling, and Glass Staining: The Valuable Receipts of the Late Mr. Thomas Lakin*.⁷ Under the recipe for a platina oxide he wrote: "[it is] prepared by taking platina and dissolving it in aqua regia composed of equal parts spirits of nitre and marine acid (solution of nitric acid and hydrochloric acid)⁸...place in a sandbath to moderate temperature...then take three parts of the spirits of tar and one part of the solution of platina, mixing the solution with the tar very gradually...the nitreous acid will evaporate and leave the platina in combination with the tar...let the solution fall into a large vessel of water at the temperature of blood heat; the sal amoniac (ammonium chloride)⁹ must then be added...on all white earthenware the platina in solution is perfectly sufficient to produce a silver lustre".¹⁰ While nothing in the metallic glazes calls for arsenic, if one turns to how to make a "common" white enamel Lakin calls for "8 parts of flint glass, 2 parts of Red Lead, ½ part of Nitre, and ½ part of Arsenic".¹¹ Jumping to Beijing, China, arsenic is found in the *Famille Rose* porcelain from the Qing Dynasty.¹² An article in *Ceramics International* in 2018, notes the decided difference of this particular pattern and the traditional Imperial ware is the opaque white enamel.¹³ The more traditional "watercolor" enamel decorations utilized by the Imperial artisans were transparent and reminiscent of watercolors.¹⁴ Through XRF testing, they found arsenic present in the *Famille Rose* porcelain and in this article the authors suggest the use of arsenic to make an opaque enamel was only used after European missionaries came over to China and shared their trade secrets.¹⁵

Health and Safety

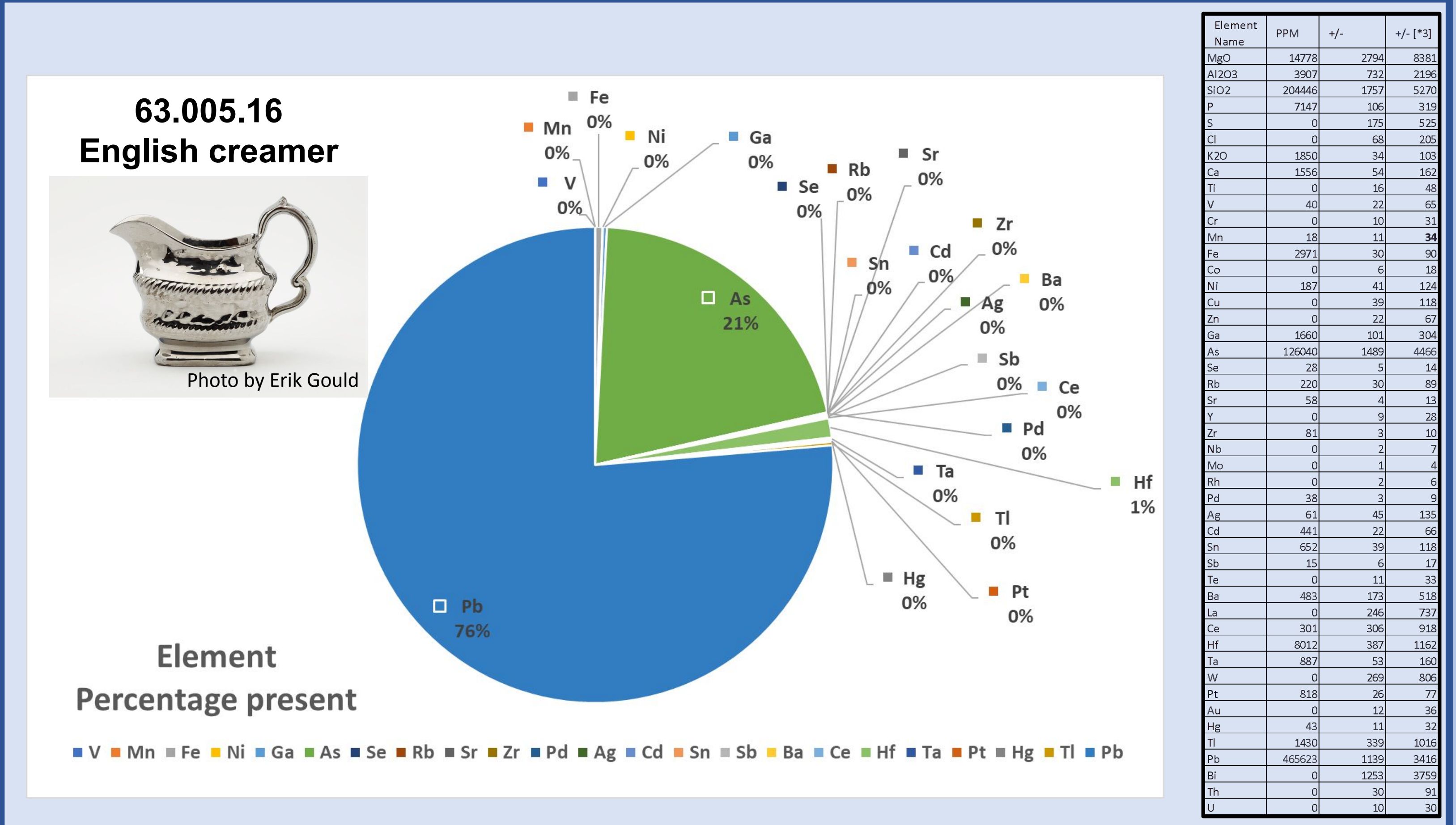
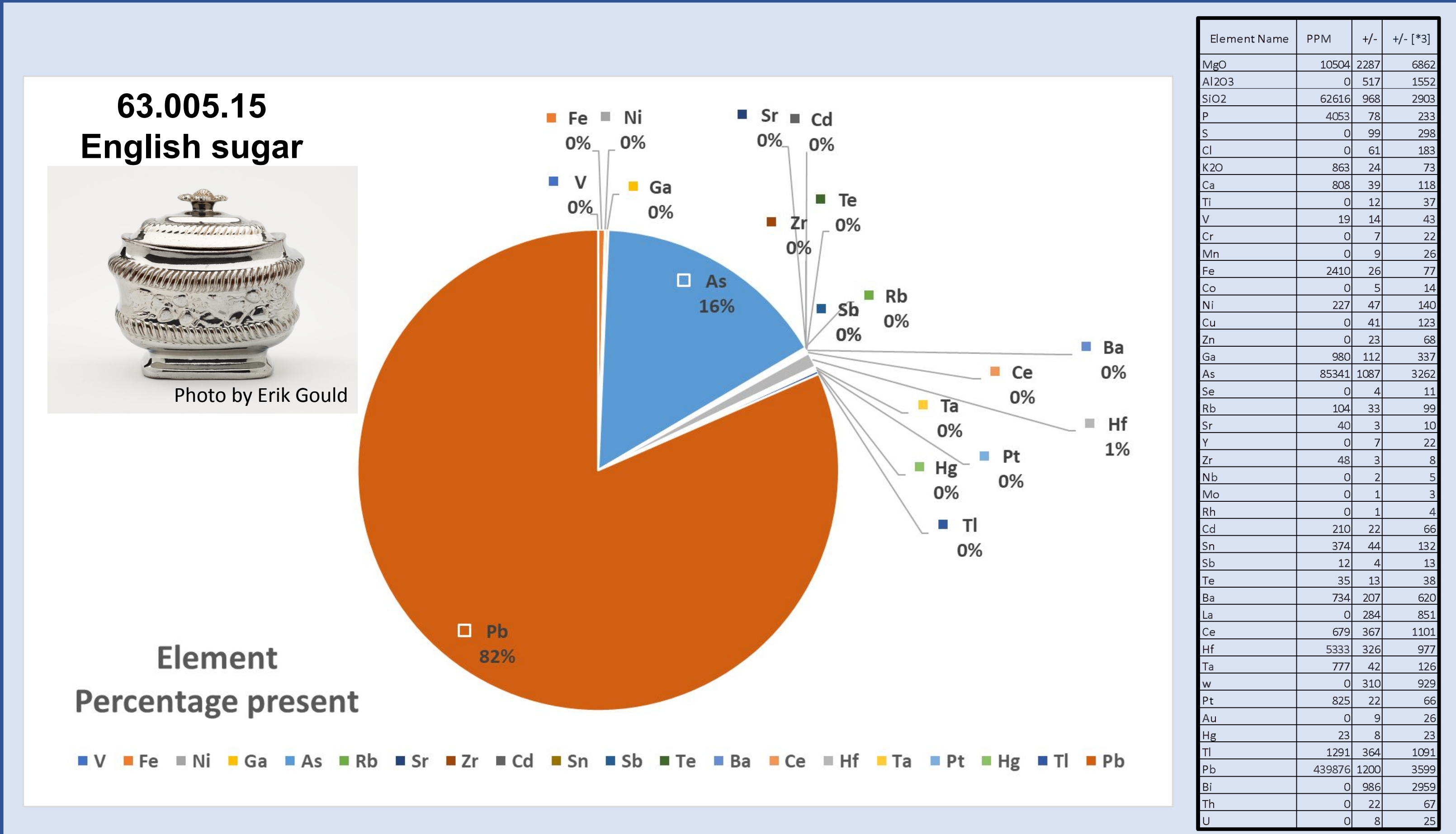
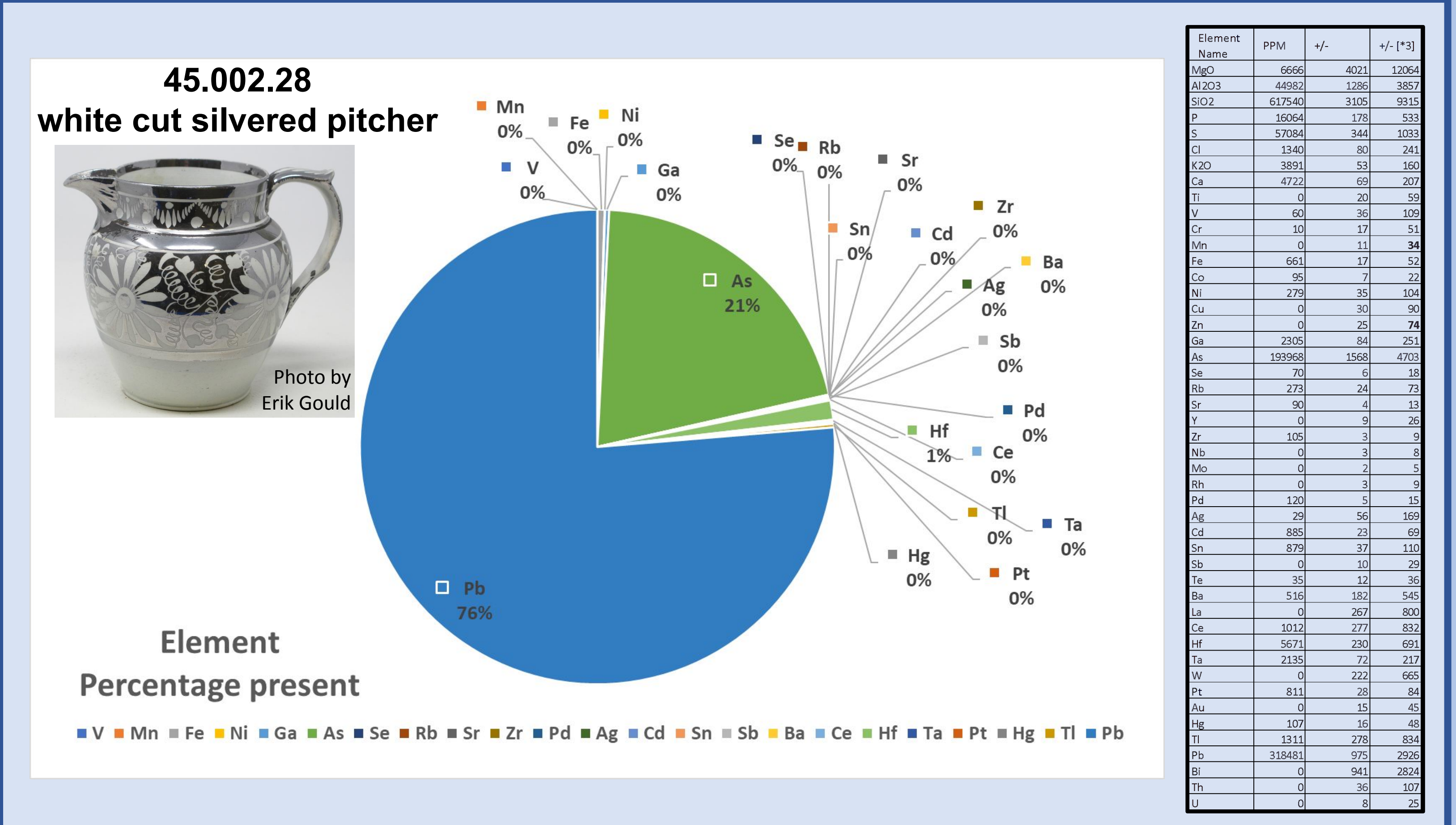
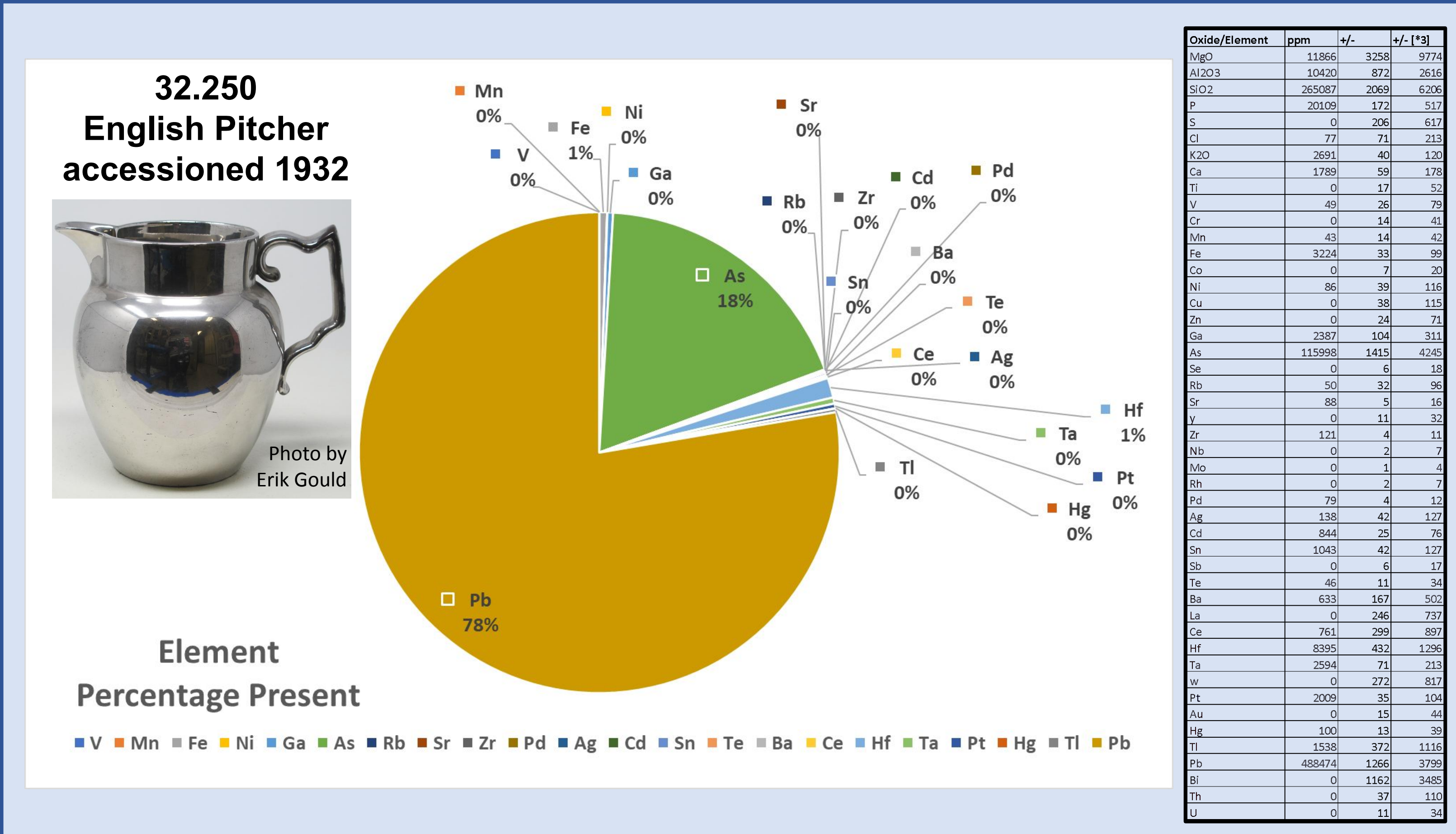
We need to know about potential hazards so that we can proceed with our work—from cleaning, handling, display, and tool disposal—safely!

Testing

In order to know how to best handle, clean, and house these pieces, we wanted to obtain the elemental data – so we would know exactly what materials were in the glazes. We tested four out of twenty pieces in this overall silver glaze category in January 2022 using a Bruker Trace Vi portable X-Ray fluorescence instrument provided by NCPTT. pXRF was chosen because of the non-destructive nature of the analysis and the resulting inorganic elemental data. We tested the surfaces of two pitchers, a sugar bowl, and a creamer. The instrument was used both in a nose-up and a nose-down configuration depending on the shape of the object being analyzed.

Data

The pXRF picked up elemental data that is consistent with the minerals found in clay, including silica, calcium, and magnesium. These are listed as oxides in the tables below for each object.. The other elements found make up the glazes.. The pie charts show the majority of the non-ceramic body elements. We found large proportions of Lead (Pb) and Arsenic (As) with smaller proportions of a variety of other elements. The L_α energy line of Pb and K_α energy line of As overlap in pXRF data¹⁶; further analysis will hopefully deconvolute the proportions of each in these samples. The flux is generally composed of manganese, lead, sodium, potassium, magnesium, zinc.



Discussion and Conclusions:

Silver Lusterware does not use Silver!

The lack of silver is not a surprise given the range of historical recipes for making imitation silver pieces and the notes in those recipes that acknowledge that silver coatings would tarnish faster.¹⁷ The large proportion of heavy metal toxins (namely Pb and As) in the coating means that we need to be aware of these components during handling and cleaning as well as in how we interpret these objects in historical use. What does it mean for the people who originally made and subsequently used these objects?

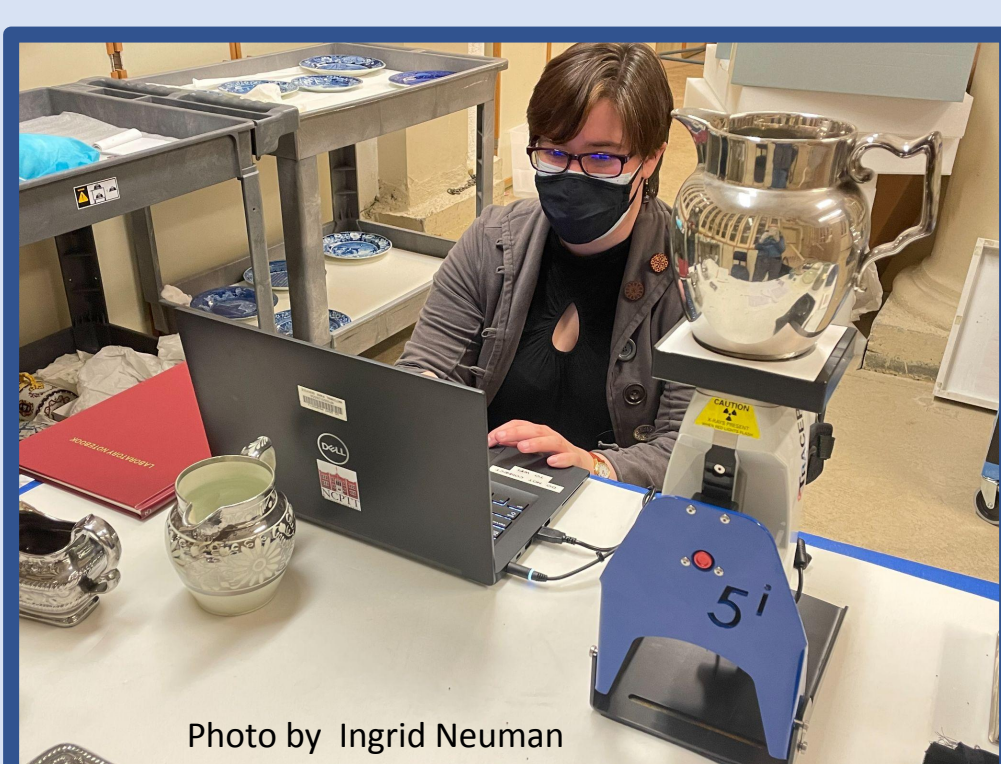
The health and safety of the artisans working in various potteries appears to not have been of importance to the owners of the factories as found in the Child Labor Commission Investigation.¹⁸ According to an investigation conducted by the Commission of Child Labor, Dr. Scriven, the doctor in charge of the examinations noted some interesting findings.¹⁹ James Tiller (43 years old) who was working as a dipper, mentioned that lead and arsenic were present in the slip even after they were told arsenic was no longer used.²⁰ Symptoms included bowel and stomach issues, paralysis, neurological disease.²¹ As a museum attached to an art school, we are concerned with contemporary makers' artistic practices.

One of the most important discoveries we made was how crucial collaboration between curators, conservators, and scientists is for a holistic examination. In order to have a better understanding of the materials we are working with, cleaning, and exhibiting, knowing the elemental data present and what is in the historic record is significant.

What Next?

Next we hope to test the remaining sixteen ceramic bodied silver luster pieces and some of our copper lusterware at the RISD Museum. Does the copper lusterware contain arsenic too? If arsenic is used in silver lusterware as an opacifier, we would like to check the elemental data present in other lusterwares. In a perfect world it would be interesting to additionally test lusterware from the 9th century, this luster is transparent and may not contain arsenic but there is only one way to find out! We also want to run replicate analyses on the objects above to resolve the proportion of lead to arsenic, and use a non-museum piece of lusterware to conduct testing of each individual layer to determine if the Pb is part of a clear coat on top of silvering, or in the silvering itself.

We would love to hear from you! Do you have ceramic bodied silver lusterware in your collections? Have you done any work with this subject? Are you interested in learning more about it? Please fill out our survey at the QR code below.



SCAN ME!



References